ENVIRONMENTAL Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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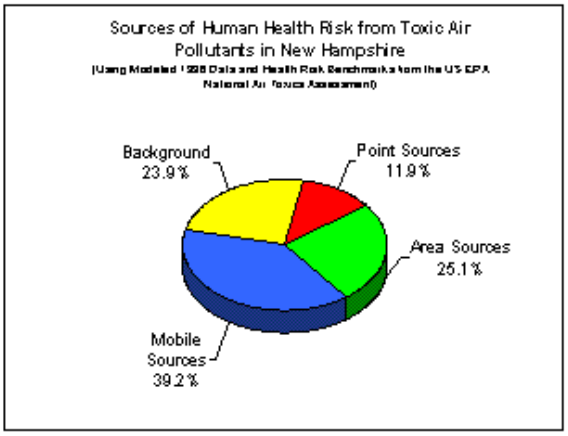
Motor Vehicles and Toxic Air Pollutants

What are Toxic Air Pollutants?

Toxic air pollutants (TAPS), or hazardous air pollutants (HAPS), are those pollutants that have the potential to cause serious adverse health effects in humans; for example, neurological, cardiovascular, liver, kidney, and respiratory effects or effects on the immune and reproductive systems. The U.S. Environmental Protection Agency (EPA) classifies these pollutants based on their potential cancer risk due to inhalation as either ***possible, probable***, or ***known human carcinogens***. Motor vehicle exhaust contains numerous toxic air pollutants, such as benzene, formaldehyde, 1,3-butadiene, and diesel particulate matter. Some additional toxic air pollutants emitted by motor vehicles include acrolein, cadmium, chromium and lead.

Air Toxics and Public Health

Motor vehicles are such an integral part of our society that everyone is exposed to their emissions. Using 1996 data, EPA estimates that on-road mobile sources (cars, trucks, and buses) are responsible for over 3,000 cases of cancer; and non-road mobile sources (construction equipment, recreational vehicles, boats, trains, aircraft) are responsible for an additional 1,850 cases of cancer each year in the U.S. Using this data for New Hampshire, almost 40 percent of all human health risk from toxic air pollutants comes from on-road and non-road mobile sources.



How are Toxic Air Pollutants from Motor Vehicles Formed?

Toxic air pollutants are typically emitted from cars and trucks through four mechanisms. First, some toxic air pollutants, such as benzene, toluene and xylenes, are components of gasoline that can be emitted into the air when gasoline evaporates during refueling or when gasoline remains in a hot engine after it is shut off. Second, these same compounds can also be emitted through the tailpipe and crankcase when the fuel is not completely burned in the engine, or as engine "blow-by." Third, a significant amount of benzene, formaldehyde, and acetaldehyde emissions from automobiles is formed in the exhaust as a result of the chemical reactions that occur when other components of gasoline are not completely burned in the engine. Finally, some toxic air

pollutants, such as formaldehyde and acetaldehyde, can also be formed through a secondary process when other toxic pollutants from car and truck engines undergo chemical reactions in the atmosphere.

What's Been Done to Control Toxic Air Pollutant Emissions?

The control of air toxics emissions from motor vehicles has been addressed at the federal level through mandates for cleaner burning fuels and technological controls on motor vehicles such as catalytic converters. Pre-1975 vehicles without catalytic converters (and even pre-1981 vehicles with simple catalysts) emit far more air toxics than newer vehicles.

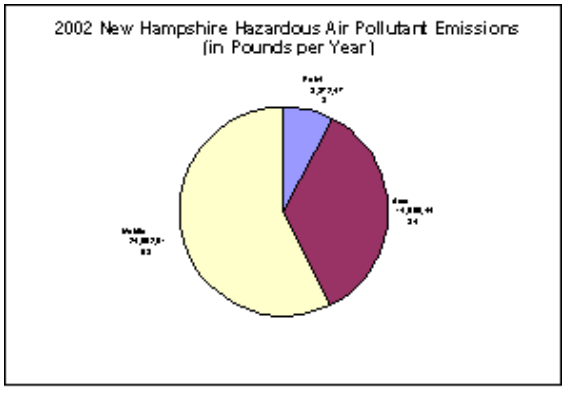
The removal of lead from gasoline, which began in the mid-1970s, has essentially eliminated mobile source emissions of this highly toxic substance. The federal government also has placed limits on gasoline volatility to control evaporative emissions of both hydrocarbon and toxic compounds. The 1990 Clean Air Act Amendments included provisions to require the use of reformulated gasoline (RFG) in the nation's most polluted cities. Federal requirements to reduce the benzene content of gasoline and to limit the amount of sulfur in diesel fuels achieved additional reductions in air toxics beginning in the mid-1990s.

At the state level, motor vehicles are currently exempt from New Hampshire's Air Toxic Control Program. To reduce emissions of air pollution and air toxics from motor vehicles, New Hampshire has creatively initiated voluntary programs that reduce unnecessary idling of heavy-duty diesel vehicles like school buses, construction vehicles, and delivery trucks, and that encourage the use of bio-diesel as an alternative cleaner-burning fuel. Emissions inspections and smoke "opacity" testing of diesel trucks have increased.

What Else Can Be Done?

Additional federal mandates for cleaner fuels and additional federal or state incentives to encourage measures like fuel economy, alternative fuels, carpooling, public transit and personal responsibility will all help reduce toxic air pollution from motor vehicles. More stringent tailpipe emission standards and test procedures for air toxics from motor vehicles are needed. The 1990 Clean Air Act Amendments do set specific emission standards for hydrocarbons (VOCs) and for diesel particulate matter, and vehicle manufacturers continue to develop technologies to comply with these standards.

Actual emissions from all mobile sources, from cars to garden equipment, are over 50 percent of total emissions of hazardous air pollutants in New Hampshire.



Source: DES Emission Inventory

The Clean Air Act requires periodic emission inspections and computerized diagnostic systems to ensure that vehicle emission controls are functioning properly.

The good news is that today's new cars, trucks, and buses emit 90 percent less hydrocarbons and 50 percent less toxic air pollutants over their lifetimes than earlier uncontrolled models. Despite improvements in individual vehicle emissions, as "dirtier" vehicles are phased out of fleets and become replaced by newer clearer burning models, it is still likely that, with more cars driving more miles every year, overall emissions of air toxics may again begin to increase.

Changing to cleaner alternative non-petroleum fuels is one strategy for reducing air toxics. Choices include natural gas, propane, and electricity. These fuels are inherently cleaner than conventional gasoline and diesel because they do not contain toxics like benzene.

For more information on air toxics from automobiles, contact the N.H. Department of Environmental Services Air Resources Division at (603) 271-1370 or visit the EPA's Office of Transportation and Air Quality website at www.epa.gov/otaq/toxics.htm.